

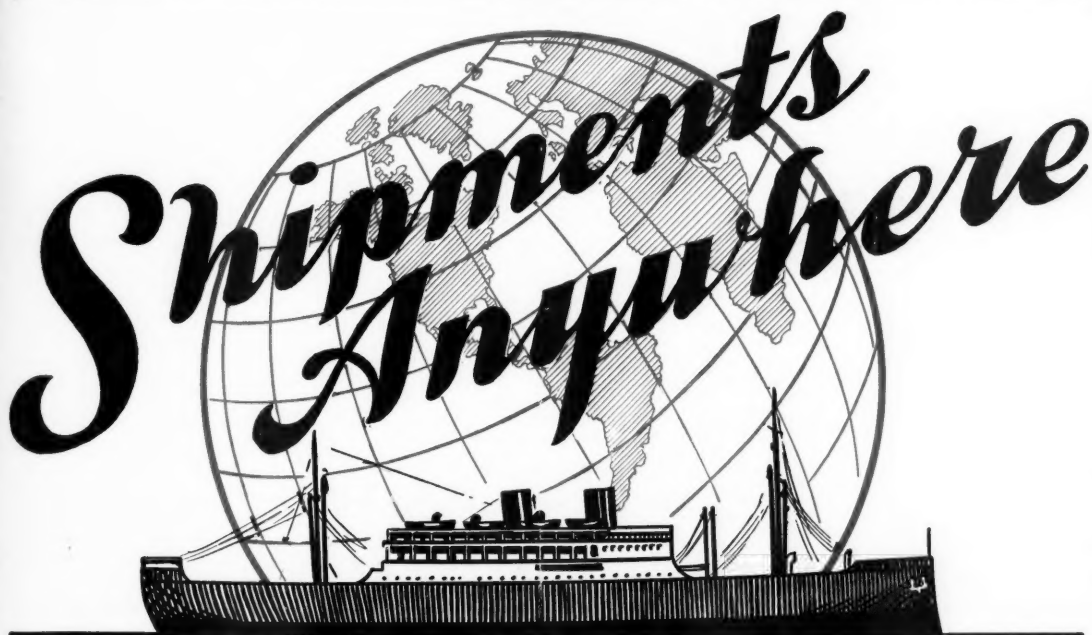
# *The* **American Fertilizer**



Vol. 92

MARCH 2, 1940

No. 5



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*See Page 25*

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... THE ...

# AMERICAN FERTILIZER

"That man is a benefactor to his race who makes two blades of grass to grow where but one grew before."

Vol. 92

MARCH 2, 1940

No. 5

## American Fertilizer Practices

The National Fertilizer Association Completes Second Survey on Commercial Plant Food Used in the United States during 1938.

**A** FIRST-HAND compilation of the practices of the American farmer in his uses of fertilizers and the factors which influence his fertilizer purchases has been completed by The National Fertilizer Association. Through the cooperation of 65 of the leading fertilizer manufacturing companies, who assigned salesmen to interview over 32,000 farmers in the 35 principal fertilizer-using states, a total of about 2,000,000 answers to a series of questions were received and tabulated by H. R. Smalley, Chief Agronomist, Robert H. Engle, Assistant Agronomist and Herbert Willett, Economist, of the Association Staff.

The area covered included the Pacific Coast states and the states east of the Great Plains. In order that the survey might be truly representative, the number of farmers interviewed in each state was, in general, proportional to the fertilizer consumption of that state. Thus in North Carolina, which used 1,104,000 tons in 1938, the number of farmers interviewed was 3,882, while in Alabama, which had a fertilizer tonnage of 528,000, the interviewers reached 1,751 farmers.

The questionnaire used contained twenty-five separate sections covering such subjects as the amount of fertilizer used per acre on different crops; the results obtained from its use; the tests made to check these results; opinions on the current level of fertilizer prices; the factors such as company reputation, service of the dealer or agent, quality of product and price, which have influenced fertilizer purchases; the farmer's trucking facilities; the prospects of increased fertilizer use; the influence of manufacturers' sales literature, agricultural station bulletins, farm papers, radio programs, etc.

Out of 32,148 farmers interviewed, only 127 refused to give the information requested. Although the interviewers were asked to take the general run of farmers in their territory, the results indicate that the status of the farmers interviewed is above the average for all farmers in the United States.

### The Use of Fertilizer

The first question—and in some ways the most important—was, "Do you use fertilizer?" As shown in Table I, those answering "yes" constituted 92.6 per cent of those answering the question. The supremacy of the southern states in the use of fertilizer is indicated by figures running to more than 99 per cent in the Carolinas, Georgia and Florida. At the other end of the scale, the percentages for Iowa and Minnesota were only 35 and 46 respectively.

### Consumption of Fertilizer by Crops

As compared with 1928, there has been a very pronounced shift in consumption of fertilizer on the several crops. For example, the 1928 survey showed that 31.4 per cent of all fertilizer was at that time used on the cotton crop and that the second crop in point of consumption was corn with 22.5 per cent of the total tonnage. The present survey shows that in 1938 corn was the largest consumer of fertilizer with 22.3 per cent of the total and cotton second with 20.5 per cent. Potatoes ranked third in 1928 with 10.3 per cent of the total but dropped to fourth place in 1938 with only 7.6 per cent of the total. The wheat crop consumed 10.2 per cent of the total tonnage in 1928 and 10.1 per cent in 1938. Tobacco was

TABLE I.  
Classification of Farmers as to Whether They  
Use Fertilizer

State	Do you use fertilizer?		
	Total Answering Question	Per Cent Answering Yes	Per Cent Answering No
Maine .....	678	96.8	3.2
New Hampshire .....	49	87.7	12.3
Vermont .....	240	89.1	10.9
Massachusetts .....	399	91.2	8.8
Rhode Island .....	50	92.0	8.0
Connecticut .....	425	88.9	11.1
New York .....	1,499	88.7	11.3
Pennsylvania .....	1,644	94.9	5.1
New Jersey .....	711	94.5	5.5
Maryland .....	652	96.2	3.8
Delaware .....	238	98.3	1.7
West Virginia .....	259	97.3	2.7
Virginia .....	2,314	97.2	2.8
North Carolina .....	3,879	99.6	0.4
South Carolina .....	2,169	99.5	0.5
Georgia .....	2,669	99.4	0.6
Florida .....	1,293	99.6	0.4
Alabama .....	1,745	98.9	1.1
Tennessee .....	976	86.2	13.8
Mississippi .....	1,286	89.1	10.9
Arkansas .....	425	86.1	13.9
Louisiana .....	616	91.1	8.9
Texas .....	309	68.0	32.0
Ohio .....	1,814	94.5	5.5
Michigan .....	919	83.1	16.9
Indiana .....	1,325	85.5	14.5
Illinois .....	411	64.7	35.3
Kentucky .....	665	84.8	15.2
Wisconsin .....	467	56.5	43.5
Minnesota .....	50	46.0	54.0
Iowa .....	100	35.0	65.0
Missouri .....	468	70.1	29.9
Washington .....	199	91.5	8.5
Oregon .....	199	79.9	20.1
California .....	879	88.6	11.4
Total .....	32,021	92.6	7.4

fifth in 1928 with 7 per cent of the total and it was also fifth in 1938 with 6.9 per cent of the total.

These five crops in 1928 accounted for 81.4 per cent of the total tonnage, whereas the same five crops in 1938 accounted for only 67.4 per cent of the total.

The big decline in consumption of fertilizer on cotton has been balanced by increased consumption on vegetables and fruits, and on hay and pasture crops. In other words, the consumption of fertilizers today is much more diversified than it was ten years ago.

TABLE II.  
Quantities of Fertilizer Used on Certain Crops in  
29 States in 1938

(Total is 97.5% of all fertilizer used in the United States in 1938)

Crop	Tons of Fertilizer	Per Cent of Total
Corn .....	1,632,600	22.3
Cotton .....	1,501,800	20.5
Wheat .....	739,300	10.1
Potatoes .....	555,500	7.6
Tobacco .....	505,400	6.9
Citrus .....	256,000	3.5
Oats .....	247,000	3.4
Hay and alfalfa .....	239,300	3.3
Sweet potatoes .....	133,000	1.8
Tomatoes .....	85,400	1.2
Peanuts .....	57,000	0.8
Apples .....	38,800	0.5
Cabbage .....	36,500	0.5
Snap beans .....	36,400	0.5
Strawberries .....	35,600	0.5
Sugar beets .....	33,000	0.5
Barley .....	32,500	0.4
Sugar cane .....	31,000	0.4
Grapes .....	30,000	0.4
Watermelons .....	24,000	0.3
Rice .....	16,000	0.2
Dry beans .....	15,100	0.2
Lettuce .....	12,100	0.2
Onions .....	12,100	0.2
Cucumbers .....	8,100	0.1
Celery .....	7,200	0.1
Cowpeas .....	6,000	0.1
Pears .....	2,500	*
Other crops .....	987,200	13.5
Total .....	7,316,400	100.0
Less than 0.1 per cent.		

#### Returns from the Use of Fertilizer

Just how much does the average American farmer get back in value of increased yield for each dollar he pays to his fertilizer dealer or agent? Taking all crops and all fertilizer-using sections of the country into consideration, it averages \$3.60. After deducting the cost of the fertilizer that leaves \$2.60 over and above the cost. Of course that isn't all clear profit, as there are some added costs to the farmer in harvesting and marketing the larger crops. If we cut the net profit down to \$2.00 for each dollar spent that is still a 200 per cent return on the investment.

It is the substantial increase in crop yields and the more profitable operations resulting from the use of fertilizer which makes it possible for farmers on less fertile farms to compete successfully with farmers having more fertile land. Without fertilizer, for instance, it would have been necessary to abandon cotton growing in the Southeast years ago.

The greatest rate of return is given to tobacco as shown by Table III. Without fertilizer, of course, the production of tobacco on a large scale would be impossible in some

areas. Cotton, fruits, and vegetables also show relatively large returns. The lowest rates are shown by grains, but in every case the value of the increased yield is more than sufficient to make the use of fertilizer quite profitable.

45.1 per cent for all the states. In the northern, wheat-growing states, reports show that as high as 70 per cent in Ohio observed reduced winter injury on fertilized wheat, while the average for all states is 24.6 per cent.

TABLE III.  
*Crop Returns from the Use of Commercial Fertilizer, by Crops*  
(Summary for all States)

Crop	Value of Crop Produced by Fertilizer	Estimated Cost of Fertilizer	Increase in Value of Crop for Each Dollar Spent for Fertilizer
Corn .....	\$84,387,890	\$40,672,300	\$2.07
Cotton .....	171,709,646	38,424,600	4.47
Wheat .....	33,355,404	18,915,600	1.76
Potatoes .....	55,004,062	17,671,050	3.11
Fruits and vegetables .....	62,501,271	16,342,400	3.82
Tobacco .....	135,937,201	15,033,000	9.04
Citrus fruits .....	31,848,310	8,819,000	3.61
Hay and alfalfa .....	11,426,347	5,161,000	2.21
Oats .....	8,108,377	5,635,500	1.44
Sweet potatoes .....	19,613,563	3,545,150	5.53
Tomatoes .....	12,108,895	2,641,200	4.58
Peanuts .....	6,210,370	1,469,000	4.23
Miscellaneous .....	77,598,839	22,617,870	3.43
Total .....	\$709,810,175	\$196,947,670	\$3.60

#### Effect of Fertilizers on Yield and Quality

The estimates of crop increases per acre from the use of fertilizers, as made by the farmers interviewed in the Survey, are in fair agreement with the national estimates quoted above. Cotton growers to the number of 10,123 stated that the use of fertilizer had increased their crops by 208 pounds of cotton per acre. In the corn territory, 17,969 farmers gave 14 bushels per acre as the average increase from fertilizer. The increases for potatoes were 117 bushels per acre, for wheat 9 bushels per acre, and for tobacco 623 pounds per acre.

As to the effect of fertilizer on quality of crops, 73 per cent of the farmers interviewed said that fertilized cash crops showed better market quality, 50 per cent said that fertilized grain and hay showed better feeding quality, 23 per cent noticed improved shipping quality in fruits and vegetables.

In addition to increased yields obtained from the use of fertilizer, other benefits to crops are well known, such as quicker starting, resistance to disease, less winter injury, earlier maturity, benefit to the following crop, and less frost injury. Out of 32,148 farmers interviewed, 27,274, or 84.8 per cent, stated that they observed that fertilizers gave crops a quicker start. The older and heavier fertilizer consuming sections of the country report a higher percentage of resistance to disease when fertilizer is applied than the average of

Early maturity of crops was observed by 76.2 per cent of all the farmers interviewed, while 56.6 per cent report benefit to crops following fertilizer application and 19.5 per cent stated they observed less frost injury.

#### Opinions on Fertilizer Prices

It is human nature for people to think that commodities they buy cost too much. Most farmers, if asked, would say that their taxes are too high, and most housewives would probably say that the price of beefsteak is too high. In addition to this common tendency, an important commodity like fertilizer is likely to seem expensive because it is usually purchased only once or twice a year. The average farmer who uses fertilizer buys around \$100 worth annually. If he bought \$2 worth each week it would probably seem less costly.

Keeping these factors in mind it is interesting to examine the answers to the question: "As compared to other things you buy, do you consider fertilizer low, average, or high in price?"

Of the 29,966 farmers who answered this question, 7.3 per cent think the price of fertilizer is relatively low, 54.7 per cent think it average and 38.0 per cent think it high. Stated a little differently, 62.0 per cent of the farmers think fertilizer low to average while only 38.0 per cent think it high. It is significant that while only 38.0 per cent of all farmers interviewed regard fertilizer as high priced, 48.5

(Continued on page 20)

## Experience With Selective Selling\*

BY JOHN L. RYON

*Vice-President in Charge of Sales, International Salt Company, Inc., Scranton, Pa.*

SCIENTIFIC management and research have worked hand in hand to lower manufacturing costs, improve products, develop new products, and find new uses for old ones. In the field of distribution, the same scientific approach has done away with "hit or miss" methods, increased the store of valuable data, and given management indispensable tools with which to work.

Our own experience is a case in point. At first thought, salt might seem to be easy to sell, being a simple, basic product. For that reason, however, and because of its natural abundance, salt is not only a low-priced product, but one subjected to particularly severe competitive selling. Moreover, it has manifold uses. We must sell to those who use salt in the production of other products, as well as to the domestic consumer.

This means that our sales contacts must be made with buyers in many industries, with wholesalers in the food field, with buying headquarters of chain food stores, and with wholesalers dealing in goods for agricultural use. Beyond this, we must maintain contact with the retailers themselves—and with the general consuming public as well, through advertising.

This means that not only our district managers, but also their salesmen, must be familiar with many uses of salt. In order to do an efficient selling job, they must be familiar with our advertising and sales promotional plans, and able to do merchandising work to increase the effectiveness of advertising in the channels of distribution and ultimate sale. This is a paradoxical situation—a simple, basic product, selling at a low price, requiring a sales force that is highly intelligent, aggressive, and capable. Under these circumstances, sales costs are likely to be excessive unless rigidly controlled.

As a result of sales control experience, our company has become far more interested in how the sales expense budget is to be used, rather than its size. By adopting this viewpoint, we have proved not only that sales control based upon selective selling gives us a better class of business, but also that it lowers our percentage of costs of sales volume and thereby increases our percentage of profit.

Several years ago we began research on our sales territories and sales methods with the thought that efficiency might be improved and costs lowered. Step by step we have gradually evolved a definite marketing policy of rigid sales control. All of this is based upon authoritative knowledge of our markets.

We sought answers to three important questions:

1. *Are present sales in the area sufficient to justify present sales costs?*

2. *Is there enough potential business in the area to justify present sales expense as an investment in developing future business?*

3. *Is the salesman covering his territory with proper frequency and in an efficient manner?*

The first step was to reestablish sales territories upon the basis of the local retail trading area, instead of upon a basis of geographical boundaries. The trading area method of sales control is completely flexible, adaptable to any business, because trading areas can be grouped into sales territories of any size for a definite improvement in efficiency over arbitrary limits of county and State lines.

Complete data as to population, sales volume at retail and wholesale, was worked out for each buying center in the trading area, for each trading area, and for each State. A buying power index, determined by 21 basic factors, is applied to each buying center, in relation to the buying power of the entire United States.

By rearranging sales territories on this concept, we have been able to work out marketing maps for every State. We can break down potential and actual sales in each man's territory, and can spot weaknesses in sales as compared with the potential.

In our business, and this is probably true in many others, it was necessary to supplement the buying power index as a measure of potential sales, due to the dual nature of our selling job. The buying power index is accurate as applied to domestic consumers. Yet a small town or city, consuming relatively little table salt, may be the site of an industrial plant consuming thousands of tons of salt annually. Therefore, in order to know the total potential salt consumption, it became important to determine separately the industrial consumption of salt in

\*From "Executives Service Bulletin" February, 1940. Published by Metropolitan Life Insurance Co.

each area. Research was undertaken by our salesmen in the course of their calls upon customers and prospects. Today we have accurate record of industrial salt consumers by trading areas to combine with our buying power index.

After adjusting sales territories, we set up ratios of performance by salesmen, in proportion to the total business available in each territory. This also gave us an equitable basis for comparing performance.

Although many combinations, consolidations, and redvisions of sales territories were made in order to equalize sales opportunity and thus tend to equalize the ratio of sales expense to actual sales, we discovered that able salesmen were making relatively poor showings due to inefficient methods of covering the territory.

#### Principles of Coverage

This led to a routing study by which we set up a permanent guide to proper coverage. We established several basic principles—some of them so simple and obvious that we had previously taken them for granted. Among these are:

1. A salesman should live in or very near to the best market in his territory.
2. A salesman must plan his day's work so that he will not double back over territory once covered.
3. A salesman's first call shall be near his starting point, and his last call shall be near the point where he is to pass the night.

Salesmen were sold on the fact that better routing and planning would help them to do their work easier and better. We listed common-sense objectives and showed each salesman how proper routing would help us to reach these objectives:

1. More complete and economical coverage of territory.
2. More calls on real prospects.
3. Correct allocation of time spent in each district, based upon the total sales potential.
4. Spending more time with buyers and less behind the wheel of an automobile.
5. Calling regularly and more often on customers and prospects that promise the most profitable sales volume, less often upon less desirable prospects, and eliminating those with poor buying possibilities.

We started this work with the idea of promoting greater efficiency in our sales force. This we did and also created a policy of selective selling—selective in the broad sense because of concentration on the better markets and, more specifically, upon the better prospects in each territory.

#### MINOR ELEMENT BIBLIOGRAPHY

The Third Edition of the "Bibliography of References to the Literature on the Minor Elements", published by the Chilean Nitrate Educational Bureau, New York, on February 1, 1939, contained 4,628 abstracts and references, in a volume of 488 pages.

Owing to its size, it has not been found practical to continue publication of complete editions of the Bibliography, especially since the volume of material becoming available makes it desirable to publish more frequently. Accordingly Supplement No. 1 to be published shortly will contain about 700 abstracts and references, noted since publication of the Third Edition.

It is planned hereafter to publish supplements at intervals of approximately one year.

A Botanical Index is now available for the Third Edition and is also being included in the Supplements.

#### PARITY PAYMENT RATES ANNOUNCED BY AAA

Rates of the parity payment which will be made to producers who plant within their 1940 acreage, announced by the AAA to be as follows: cotton, 1.55 cents per pound; corn, 5 cents per bushel; wheat, 10 cents per bushel; rice, 1.7 cents per cwt.

The 1940 payments are to be made on five basic crops if the 1939 average farm prices were less than 75 per cent of parity. Since the estimated 1939 season average price of each kind of tobacco was above 75 per cent of parity, no price adjustment payments will be made on that crop in 1940.

The appropriation will be divided as follows: cotton, \$96,000,000; corn, \$48,600,000; wheat, \$57,100,000; rice, \$300,000.

#### NEW JERSEY FERTILIZER TONNAGE

New Jersey fertilizer tonnage in 1939 was somewhat larger than in 1938, it is reported by Charles S. Cathcart, State Chemist. With the exception of 1937 last year's tonnage was the largest since 1922. Comparative data for recent years follow:

Year	Mixed Fertilizers	Materials	Total
1929	120,846	20,326	141,172
1930	135,715	20,730	156,445
1936	144,517	16,224	160,741
1937	163,094	20,858	183,952
1938	152,371	19,351	171,722
1939	152,627	23,543	176,170

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## Canadian Fertilizer Supplies\*

The Fertilizer Supply Committee has put into effect Order-in-Council P.C. 3124, designed to control fertilizer materials under war conditions. Part 1 of the Order, which requires that exports be allowed only as permitted by the Minister of Agriculture, has undoubtedly had the effect of promoting increased fertilizer supply in Canada so that exporters would be sure of obtaining permits.

Surveys of supply indicate a very satisfactory condition for the 1940 fertilizer trade in Canada. Even potash, in which a shortage was feared a few weeks ago, is now in excellent supply; and Canadian trade is practically sure of continued supply in sufficient amount from French and American sources. The one item in which a slight shortage may develop is sulphate of potash, which is not yet made in the United States on a sufficient scale to warrant export to Canada. Information from French sources, however, indicates that a larger supply may be available shortly. Sulphate of potash, of course, is required in the production of tobacco in Ontario and Quebec, and some 10,000 tons per annum are used for this purpose.

Water-soluble magnesium, in the form of double magnesium sulphate salts and sulphate of potash-magnesia, has been cut off since the war; but the Fertilizer Supply Committee has investigated substitutes for these items and believes that dolomite limestone, finely ground, will answer the purposes of the fertilizer trade.

With regard to Part 2 of the Order-in-Council, which gives the Provinces the power to name the mixed fertilizers which may be sold within the Province to tie in with Provincial crop production programs—all Provinces, except Manitoba, Saskatchewan and Alberta, have made their decision.

The list of fertilizers which may be sold under these regulations in various Provinces is given:

### Ontario

For general crops: 0-12-6, 0-12-10, 0-12-15, 0-16-6, 2-8-16, 2-8-24, 2-12-6, 2-12-10, 2-16-6, 2-8-10, 3-10-5, 4-8-6 and 4-8-10, and Humber Fish Manure.

For tobacco: 2-10-8, 3-10-8, 2-12-6, 2-12-10, 4-8-10 and 4-8-6.

For turf and lawns: 10-6-4.

### Quebec

0-16-6, 2-12-6, 2-12-10, 2-16-6, 4-8-10,

\* Reprinted from Canadian Chemistry and Process Industries, February, 1940.

9-5-7 (orchards), and 3-8-15 by prescriptions.  
5-8-10 and 5-8-7 for cigar and pipe tobacco;  
2-12-8 and 2-12-10 for flue-cured tobacco.

#### Maritimes

0-16-6, 2-12-6, 4-8-10, 4-8-13, 5-9-8,  
5-10-5 and 9-5-7.

#### British Columbia

0-12-10, 0-10-16, 2-16-6, 2-10-8, 2-19-0,  
3-10-8, 4-10-10, 4-12-4, 5-10-5, 6-7-4,  
6-7-10, 6-10-10, 6-20-6, 6-30-15, 9-27-9  
11-48-0 and 16-20-0.

Since the principal fertilizers sold in the Prairie Provinces are the standard materials, such as ammonium phosphates, etc., and not mixtures, it is not expected that these provinces will name any special mixed fertilizers and will have their sales wide open as Prairie demand requires.

Another point of interest is that the provinces of Ontario and Quebec, which are concerned with tobacco fertilizers, have recommended, through their provincial fertilizer councils, that the maximum amount of chlorine in flue-cured tobacco fertilizers should be raised from the present 2 per cent to 3 per cent, owing to the prospective shortage of sulphate of potash. No change was made regarding fertilizers for cigar tobacco.

### PROPOSED STATE LEGISLATION

#### Virginia

House Bill No. 214 has been introduced in the Virginia legislature, amending certain sections of the Virginia Fertilizer Law. The principal changes proposed are: nitrogen shall be guaranteed only as total nitrogen, water-insoluble nitrogen, and nitrate nitrogen if claimed, but not less than  $\frac{1}{2}$  of 1 per cent of nitrate nitrogen may be claimed. The packages must contain a statement as to whether the fertilizer is acid-forming or non-acid-forming. Provision is made for the guarantee of total magnesium oxide and of water-soluble or available magnesium oxide, if claimed. The minimum plant-food content is raised to 16 per cent. In connection with the guarantee as to the fertilizer being acid-forming or non-acid-forming, a tolerance of 100 pounds in terms of calcium carbonate per ton will be allowed.

#### Kentucky

House Bill 345 has been introduced into the Kentucky legislature by W. K. King, propos-

ing an entirely new fertilizer law. The bill proposes to leave to the discretion of the Director of the State Experiment Station what plant nutrients shall be guaranteed and the form and manner in which they shall be guaranteed. The names of ingredients must be stated and the percentage of any substance which may be injurious to plants is required. The inspection fee remains at 50 cents for each ton which is offered for sale at \$15 or more per ton. A fee of 25 cents a ton is provided for fertilizer sold or offered for sale at a retail price of less than \$15 a ton. The Director is given authority, in the proposed bill, to specify and fix the minimum content of any plant nutrient that materials and mixtures of materials may contain or the maximum content of any injurious substance and to specify the form in which the percentages of plant nutrients will be expressed. The proposed bill provides for no notice of change in regulations by the Director. It is a far greater delegation of power to the control official than is contained in any present fertilizer control law.

### CORN COST GOES DOWN AS ACRE YIELDS GO UP

Yield per acre is obviously the most important single element in determining the net cost of producing a bushel of corn, according to analysis by the Department of Agriculture, published in Crops and Markets. Tabulated costs for 1938 by groups of States in which conditions are generally similar, show that in Illinois and Iowa with yields averaging 45 bushels to the acre, the cost averaged 47 cents a bushel in 1938. Ohio, Indiana, Michigan, Wisconsin, and Minnesota corn with a 40-bushel average cost 59 cents. With a yield of less than 15 bushels to the acre, the southeast was the high cost producing area, averaging \$1.08 a bushel.

Seed cost averaged 82 cents an acre in Iowa and Illinois, just about double the cost—38 to 43 cents—outside the Corn Belt. This reflects the widespread use of the more expensive but more productive hybrid seed now available for the high yield areas. In the other Corn Belt states, seed cost averaged 68 cents an acre.

Net acre costs, including rent, fell into three distinct groups: \$21.15 an acre for Iowa and Illinois, \$22.31 for the Northeastern states and \$23.69 for the Corn Belt outside Illinois and

Iowa. In other areas costs ranged between \$12 and \$16 an acre.

Land rent averaged \$6.05 an acre in Iowa and Illinois, \$4.83 in the rest of the Corn Belt, \$4.67 in the Northeast, and from \$2.37 to \$3.57 elsewhere.

### JANUARY SUPERPHOSPHATE PRODUCTION INCREASED

January superphosphate production in plants of reporting acidulators was the largest in the past several years, according to the monthly compilation of The National Fertilizer Association. Production for the month totaled 392,000 tons. The previous peak for recent years was 384,000 tons, in March, 1937. The trend of production has been upward since early last fall, following the decline of 1938. Production in both areas was sharply higher than a year ago, with an increase of 48 per cent in the North and a 36 per cent rise in the South. Aggregate output in the first seven months of the current fiscal year, from July through January, exceeded production in the comparable period of last year by 23 per cent. The larger gain in this period took place in the northern area.

Stocks of bulk superphosphate showed a small increase during January, following the usual seasonal trend. In past years stocks have generally reached the year's peak at the end of January and have then declined through May. Stocks were somewhat smaller than a year earlier, with decreases reported by both areas.

Although stocks in base and mixed goods rose by 194,000 tons during January, this was of about the normal seasonal extent. There has been a moderate increase in the past year but the present volume is less than two years ago.

### Superphosphate Production, Shipments, and Stocks for January and July-January, 1940 and 1939

Expressed throughout in equivalent tons of 16% A.P.A. Based on reports by acidulators to The National Fertilizer Assn.

	United States	
	1940	1939
Stocks—First of month:		
Bulk superphosphate .....	1,051,557	1,167,242
Base and mixed goods .....	638,440	600,861
Production:		
Bulk superphosphate .....	376,820	266,477
Base and mixed goods .....	14,983	9,963
Total Production .....	391,803	276,440
Other Receipts* .....	51,459	45,869
Book adjustments .....	-6,732	-5,519
Total Supply .....	2,126,527	2,084,893
Shipments:		
Superphosphate:		
To mixers .....	101,048	87,364
To other acidulators .....	46,207	37,319
To consumers, etc. ....	23,286	24,446
Total Superphosphate ....	170,541	149,129
Base and mixed goods .....	42,707	37,551
Total Shipments .....	213,248	186,680
Stocks—End of month.....	1,081,255	1,117,132
Base and mixed goods .....	832,024	781,081
Total Stocks .....	1,913,279	1,898,213

### Accumulated Production and Shipments for July-January

	United States	
	1939-40	1938-39
Production:		
Bulk superphosphate .....	2,122,668	1,721,779
Base and mixed goods .....	75,518	69,521
Total Production .....	2,198,186	1,791,300
Shipments:		
Superphosphate:		
To mixers .....	648,505	479,493
To other acidulators .....	288,533	278,094
To consumers, etc. ....	223,360	199,012
Total Superphosphate ....	1,160,398	956,599
Base and mixed goods .....	331,989	353,641
Total Shipments .....	1,492,387	1,310,240

\* Includes inter-company transfers.  
Base includes wet and/or dry base.

## BRADLEY & BAKER

### FERTILIZER MATERIALS - FEEDSTUFFS

### AGENTS - IMPORTERS - BROKERS

155 E. 44th Street  
NEW YORK

Clinton St. & Danville Ave.  
Baltimore, Md.

#### BRANCHES

505 Royster Building  
Norfolk, Va.

505 Barnett Bank Building  
Jacksonville, Fla.

## FERTILIZER MATERIALS MARKET

### NEW YORK

Late Fertilizer Season Indicated by Weather Conditions. Market Sluggish.  
Little Sulphate of Ammonia Available for Export.

*Exclusive Correspondence to "The American Fertilizer."*

NEW YORK, February 27, 1940.

With heavy snows in many parts of the country and general cold throughout the U. S., the indications are that we will have another late fertilizer season.

The fertilizer materials' market continues sluggish with very little buying.

#### Nitrate of Soda

Price unchanged and schedule of \$27.00 in bulk and \$29.00 in 100-lb. bags, port basis prevails.

#### Sulphate of Ammonia

Scheduled \$28.00 price in bulk remains firm with supplies rather scarce. Very little material available for export and general price of about \$36.00 in second hand bags f.a.s. port is asked for such small lots as are available in the hands of resellers.

#### Superphosphate

The general price of \$8.50 per ton for run-of-pile material prevails.

#### Potash

There is not much activity in this market with price unchanged at 53½ cents per unit K<sub>2</sub>O in bulk, basis ex vessel Atlantic and Gulf ports.

#### Nitrogenous Material

Domestic supplies are plentiful with little buying demand. Foreign leather meal is being offered for shipment at about \$2.45 per unit (2.98 per unit N) without interest being shown by buyers.

#### Tankage

This market also continues quiet. Price on imported material is slightly lower and is available at \$3.30 (\$4.01 per unit N) and 10 cents c.i.f. ports.

#### Dried Blood

This market continues quiet and shows signs of weakness. Price is now about \$3.10 (\$3.77 per unit N).

#### Fish Scrap

No activity in Chesapeake Bay. Japanese sardine meal is selling at the same price, that is, \$51.00 ports.

### BALTIMORE

More Active Preparations for Spring Shipping Season.  
Not Much Fill-in Demand Expected  
Until Later in Season.

*Exclusive Correspondence to "The American Fertilizer."*

BALTIMORE, February 27, 1940.

With improved weather conditions there is more activity on the part of manufacturers in getting ready for their spring shipping season. In the meantime the market on materials is dormant and no change is anticipated until well on into the season when there may be spot demand for materials to fill in.

*Ammoniates.*—The market on feeding materials is practically unchanged, and tankage is still nominally quoted at \$4.10 per unit of nitrogen and 10 cents per unit of B.P.L., f.o.b. Baltimore. It is anticipated in some directions that the peak of the demand is now about over and that lower prices will prevail later.

*Nitrogenous Material.*—There has not been any improvement in the demand and the nominal market is \$3.10 per unit of nitrogen, but this could probably be shaded on firm bid.

*Sulphate of Ammonia.*—While the nominal market continues at \$28.00 per ton of 2,000 lb. in bulk, f.o.b. Baltimore, it would probably be difficult to secure any appreciable tonnage on this basis, and re-sale offerings are at a minimum. Manufacturers are now approach-

# FERTILIZER MATERIALS

LET US QUOTE  
YOU ON YOUR  
REQUIREMENTS  
OF THESE  
MATERIALS

✦  
PHOSPHATE ROCK  
✦  
SUPERPHOSPHATE  
✦  
DOUBLE  
SUPERPHOSPHATE  
✦  
NITRATE of SODA  
✦  
SULPHURIC ACID  
✦  
SULPHATE of  
AMMONIA  
✦  
BONE MEALS  
✦  
POTASH SALTS  
✦  
DRIED BLOOD  
✦  
TANKAGES  
✦  
COTTONSEED MEAL  
✦  
BONE BLACK  
✦  
PIGMENT BLACK  
✦  
SODIUM  
FLUOSILICATE



## ARMOUR FERTILIZER WORKS

General Offices: Walton Building, Atlanta, Ga.

### Division Sales Offices:

Albany, Ga.	Columbus, Ga.	New Orleans, La.
Atlanta, Ga.	East St. Louis, Ill.	New York, N. Y.
Augusta, Ga.	Greensboro, N. C.	Norfolk, Va.
Baltimore, Md.	Havana, Cuba	Presque Isle, Me.
Birmingham, Ala.	Houston, Texas	San Juan, P. R.
Chicago Heights, Ill.	Jacksonville, Fla.	Sandusky, Ohio
Cincinnati, Ohio	Montgomery, Ala.	Wilmington, N. C.
Columbia, S. C.	Nashville, Tenn.	

ing the heaviest consuming period of the year, and if the tonnage of complete fertilizer is normal, there will probably be no surplus available for several months at least.

**Nitrate of Soda.**—The seasonal demand keeps improving, and the market continues firm at \$29.00 per ton of 2,000 lb., f.o.b. port warehouse, in 100-lb. bags, with usual differential for 200-lb. bags and in bulk.

**Fish Meal.**—While the demand has slackened up, the market continues firm at \$58.00 per ton of 2,000 lb., in bags, f.o.b. Baltimore, guaranteed 55 per cent protein.

**Superphosphate.**—Producers are now busy delivering on contracts previously booked, and no heavy stocks are accumulating. Unless there is some unforeseen change in the situation affecting the market, the present price of \$8.50 per ton of 2,000 lb., basis 16 per cent for run-of-pile, and \$9.00 for flat 16 per cent, both in bulk, f.o.b. Baltimore, will probably continue throughout the present spring season.

**Potash.**—There seems to be ample to go around, with result that there is practically no new business passing, and no change anticipated over the balance of this season.

**Bone Meal.**—On account of the prevailing high price, the demand seems to be decreasing each year. However, with European bone meal almost eliminated from the market, the price remains firm at \$32.00 to \$36.00 per ton for 3 and 50 per cent steamed bone meal, with 4½ and 47 per cent South American raw bone ranging from \$30.00 to \$32.00 per ton, c.i.f. Baltimore.

**Bags.**—The burlap market during the past two weeks has again eased off, and the present price of plain, new, 10-oz. bags for spring delivery is about \$116.00 per thousand, basis 40 cut 54 in., delivered Baltimore, with very little new business passing.

## ATLANTA

**Increased Freight Rates Raises Price Quotations on Imported Materials. Normal Fertilizer Consumption During 1940 Expected.**

*Exclusive Correspondence to "The American Fertilizer."*

ATLANTA, February 26, 1940.

Further increases in ocean rates both in Europe and South America are making themselves felt in the quoted prices on certain materials. It is becoming evident that, if the war continues, higher rates may be expected.

The fertilizer movement in the Southwest is expected to get under way within about two weeks and should run on the average through the balance of March and April. Indications now point toward a normal consumption of fertilizer with a little more emphasis being put on cotton. Any increase in tobacco is being discouraged on account of the curtailment of foreign demand. Fruit and truck crops should come in for their usual quota of fertilizers.

The markets generally have not seen any radical changes and prices nominally are as follows:

**Tankage.**—Imported, \$3.50 (\$4.25½ per unit N) and 10 cents, c.i.f.; domestic, \$3.00 (\$3.64½ per unit N) and 10 cents, Chicago.

**Blood.**—Imported, \$3.40 (\$4.13½ per unit N), c.i.f.; domestic, \$3.15 (\$3.83 per unit N), Chicago.

**Sulphate of Ammonia.**—Unchanged but new bookings for prompt shipment hard to obtain.

**Nitrate of Soda.**—Shipping orders now coming in with fair pre-season movement.

**Nitrogenous Tankage.**—Domestic, \$1.90 to \$2.00 (\$2.31 to \$2.43 per unit N), Western producing points; imported, \$2.60 (\$3.16 per unit N), c.i.f.

**Fish Meal.**—Menhaden fishing season about over; limited quantity of acid scrap at \$2.50

Manufacturers' Sales Agents for **DOMESTIC**  
**Sulphate of Ammonia**  
 Ammonia Liquor :: Anhydrous Ammonia

**HYDROCARBON PRODUCTS CO., INC.**  
 500 Fifth Avenue, New York

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

# NATURAL CHILEAN *Nitrate of Soda*

**Old Style and Champion  
Both Guaranteed  
16% NITROGEN**

Valuable not only as a source of nitrogen, but also to help maintain the supply of other plant food elements *naturally* blended with it.

**YAS SUH, FOLKS..  
An' Now We's Back  
on Yo' Radio**



Enjoy the Uncle Natchel program every Saturday night on WSB, WRVA and WSM, and every Sunday afternoon on WIS, WPTF, WBT, KWKH, WJDX, WMC, WWL, WAGF, WDBO, WSFA, WJRD, WJBY.

## CHILEAN NITRATE Sales Corporation

120 BROADWAY, NEW YORK

RALEIGH, N. C. ATLANTA, GA. JACKSON, MISS.

MONTGOMERY, ALA. COLUMBIA, S. C.

LOS ANGELES, CALIF.

(\$3.04 per unit N) and 50 cents; Carolina producing points.

*Raw Bone Meal*.—4½ and 45 per cent, \$30.00, c.i.f.

*Steam Bone Meal*.—3 and 50 per cent, \$27.00, c.i.f.

*Cottonseed Meal*.—Prime 8 per cent market firmer; Memphis, \$29.50 to \$30.00; southeastern mill points, \$1.50 per ton higher.

### TENNESSEE PHOSPHATE

Phosphate Rock Shipments in 1939 Exceed Previous Year. Shipments for Direct Application in 1940 Also Increasing. Death of Col. Armstrong.

*Exclusive Correspondence to "The American Fertilizer."*

COLUMBIA, TENN., February 26, 1940.

The estimated total shipments of phosphate and phosphatic raw material from the Tennessee field in 1939 aggregated about 770,000 long tons, in addition to about 250,000 tons used in the furnace plants in the field to produce elemental phosphorus. About 250,000 tons of the first named figure went to the TVA plant at Muscle Shoals. Of the remainder shipped to other points, probably 400,000 tons was for the manufacture of superphosphate, 60,000 tons for direct application to the soil, and the rest for various manufacturing purposes in miscellaneous lines.

Shipments of ground rock for direct application during January and so far in February, have exceeded 1939 shipments to that channel by about ten per cent, notwithstanding the severe winter weather experienced over the entire consuming area as well as in the field of production, whereas in 1939 the two months in question were characterized by beautiful weather.

Col. E. L. Armstrong, direct descendant of one of the pioneer settlers of the famous Zion tract near Ashwood, 140 years ago, died of pneumonia in his 85th year, on February 23rd. Col. Armstrong lived near Mt. Pleasant where his beautiful farm was one of the show places, when the phosphate deposits were discovered in 1896, and was from the first interested in the development, though in the early 1900's he sold his interests to the Virginia Carolina Chemical Co. His hospitable home was always a mecca for visiting phosphate people, and up to the time of his last illness, he retained a lively interest in all matters and as President of the Century Club, was literally the host of every visitor to Columbia, while his name was a household word with every one in Maury Co.

## AMERICA'S QUALITY MULTIWALL PAPER FERTILIZER BAG

If you use, or now consider using, paper bags for packing fertilizer, it will pay you to investigate Bemis Multiwall Paper Fertilizer Bags. No other paper bag has the same uniform quality construction to give your product complete protection in transit and storage. And you get extra sales appeal from the unusually clear-cut printing of your brand on Bemis Bags.

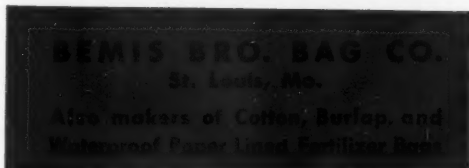


### Note These Bemis Features

**SELF-FORMING GUSSETS**—Bemis Self-forming gussets speed closing because the gussets re-form automatically, facilitating the sewing operation. Full open mouth aids filling.

**UNIFORM QUALITY CONSTRUCTION**—Your product is assured un failing protection by the uniformity of Bemis construction and the high quality of materials used.

**SPECIAL BEMIS PROTECTION**—Siftproof... moisture-resistant... airtight... odorless... any or all of these specialized protective features are available in Bemis Multiwall Bags.



### Closed by Sewing or Tape

In many cases present sewing equipment will prove satisfactory, or can be inexpensively adapted for closing Bemis Multiwall Paper Fertilizer Bags. Where an extra-strong, siftproof or more attractive closure is desired, a Bemis Tape Sealer is recommended.

Quick, dependable service is assured through strategically located Bemis plants and sales offices. Send coupon below today.

BEMIS BRO. BAG CO., 411 Poplar Street, St. Louis, Mo.  
Send me details and prices on Bemis Multiwall Paper Fertilizer Bags. We use \_\_\_\_\_ lb. Bags. They are closed by  
☐ Machine Sewing ☐ Hand Sewing ☐ Wire Ties  
We (do) or (do not) need waterproof protection.

Firm Name \_\_\_\_\_  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

## CHICAGO

**Market Quiet. Sellers Waiting for Fill-in Orders  
Later in Spring. Some Feed  
Materials Lower.**

*Exclusive Correspondence to "The American Fertilizer."*

CHICAGO, February 26, 1940.

But little action has been witnessed in the organic market, and no noteworthy changes in asking prices are apparent. Sellers are of the opinion that lowering prices would not create buying interest at this time, and that fill-in orders will be forthcoming during March and early April.

The last price of digester tankage was reduced this month to \$50.00 per ton while meat scraps list remained at \$47.50 per ton.

Nominal prices are as follows: High grade ground fertilizer tankage, \$2.90 to \$3.00 (\$3.52½ to \$3.64½ per unit N) and 10 cents; standard grades crushed feeding tankage, \$3.00 to \$3.15 (\$3.64½ to \$3.83 per unit N) and 10 cents; blood, \$3.10 to \$3.15 (\$3.77 to \$3.83 per unit N); dry rendered tankage, 67 to 72 cents per unit of protein, Chicago basis.

## WILMINGTON

**Little Interest in Materials Market. Fishing Season  
Continued Later than Usual. Federal  
Investigation Proceeding.**

*Exclusive Correspondence to "The American Fertilizer."*

WILMINGTON, February 26, 1940.

Interest is still very slight in fertilizer materials generally. Organics are weaker, with the exception of cottonseed meal which showed some strength during the past two weeks, although purchases reported were not important.

Fishing is about over after a most unusual season. A surprising tonnage of scrap was made after January 1st, whereas it has been

the custom to close the plants after Christmas. Spotted catches caused corresponding changes in the market as lots were offered or the material was not available for purchase.

The trade seems to be satisfied now that they will receive sufficient sulphate of potash for their requirements and almost every one has more muriate than they expect to need.

With the breaking of the weather, tobacco plant beds begin to show their white covers over the landscape, evidencing the intention of the farmers to be amply supplied with plants for such acreage as they will be permitted to plant.

Federal investigation of the industry continues, with a number of individuals having been summoned before the Grand Jury in Winston-salem, N. C. and with the others expecting similar summons daily. The members of the industry welcome a fair investigation, although, coming at this season of the year, it is rather annoying, especially if all of their records are to be sent away for a few weeks when they need them most.

## PHILADELPHIA

**Prices on Organics Declining. Deliveries on Contracts  
Have Increased.**

*Exclusive Correspondence to "The American Fertilizer."*

PHILADELPHIA, February 27, 1940.

The fertilizer materials market continues to slip slowly, organics in particular declining. Deliveries of nitrate of soda and sulphate of ammonia increased.

**Nitrate of Soda.**—Deliveries have increased. Price remains \$27.00 in bulk, with usual differential in 200-lb. and 100-lb. bags.

**Sulphate of Ammonia.**—Deliveries continue heavy. Price remains \$28.00, port basis.

**Dried Blood.**—Being offered at \$3.10 per unit (\$3.77 per unit N) with no interest being shown by buyers.



Trade Mark Registered

## MAGNESIUM LIMESTONE

**"It's a Dolomite"**

**American Limestone Company**

**Knoxville, Tenn.**

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

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## SULPHUR AND ITS DESTINY

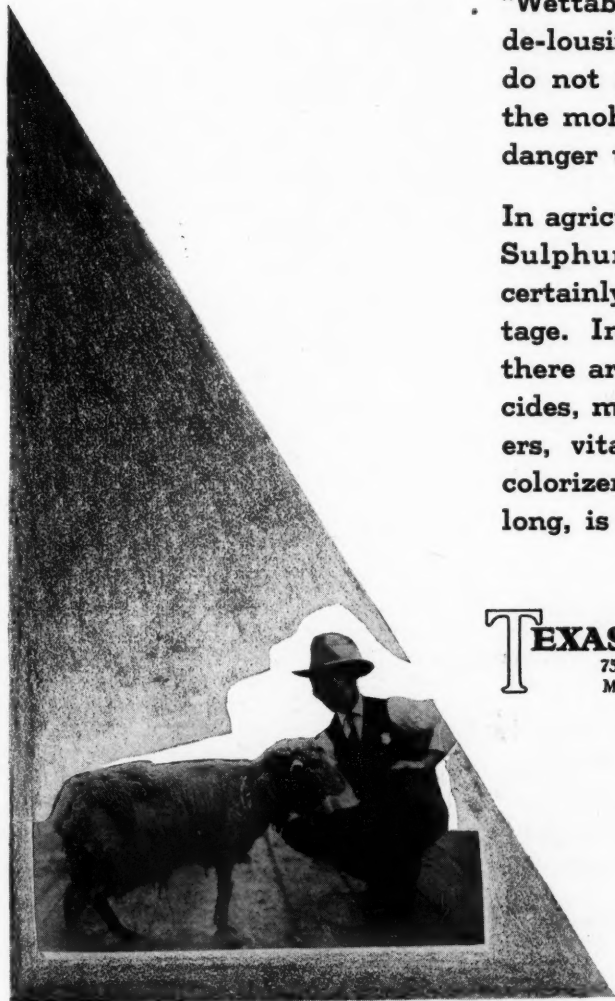
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...from the deep deposits  
in Southeastern Texas  
through the Chemical  
Plant to the Stock  
Farm in the Form of...

### DIPPING SOLUTIONS

"Wettable Sulphurs" are used for de-lousing goats and sheep. They do not stain, coarsen, or tangle the mohair or wool. There's no danger to the stock.

In agriculture and stock-raising, Sulphur and its compounds certainly are used to good advantage. In addition to fertilizers, there are the insecticides, fungicides, medicinals, soil-conditioners, vitamin preservatives, decolorizers, etc. The list, already long, is still growing.



**TEXAS GULF SULPHUR CO.**  
75 E. 45<sup>th</sup> Street New York City  
Mines: New Gulf and Long Point, Texas

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

**Tankage.**—Offered at \$2.90 (\$3.52½ per unit N) and 10 cents with no buyers.

**Bone Meal.**—3 and 50 per cent quoted at \$32.00 to \$33.00; 4½ and 45 per cent at \$35.00.

**Superphosphate.**—Firm. Some deliveries being taken on contracts.

#### AMERICAN FERTILIZER PRACTICES

(Continued from page 7)

per cent of the non-users who were interviewed think it high priced. In other words, farmers who use fertilizer and know what it accomplishes think fertilizer is cheaper than do those who do not use it. It is also true that the larger users think it less costly than do the small users.

There is a common misconception among farmers that fertilizer is too high priced, according to 168 of the men who interviewed them. Such opinions really are misconceptions, and the 92.7 per cent of the farmers who think that fertilizer is average or high-priced in comparison with other commodities they buy are not familiar with the relative prices of other commodities.

#### Prospective Increase in Use of Fertilizer

That the rate of application should continue upward in the future, is indicated by opinions of farmers who were interviewed in the survey. "If you think it would pay you to use more fertilizer per acre," they were asked, "are you planning to use more?"

The opinion that it would pay to use more was expressed by 15,432 farmers, or 51.9 per cent of those interviewed. Of that number 9,679 farmers stated that they were planning to use more. This represents 62.7 per cent of the number who said they thought it would pay to use more, and 32.5 per cent of all farmers. If one-third of all fertilizer users increase their rate of application it is quite apparent that total tonnage would be materially increased. It means, for instance, that if they raised the amount used per acre by only 10 per cent a total increase of 250,000 tons would result. Since more than half of all fertilizer users who think it would pay to raise the amount applied per acre, and since one-third of them are

definitely planning on using more, sales efforts directed at present customers should prove effective and should increase fertilizer tonnage.

West Virginia, Mississippi, Kentucky, and Arkansas rank high in the proportion of total farmers who plan to use more fertilizer. Government census statistics indicate that less than half of the farmers in these states now use fertilizer. Consequently they would seem to offer two important markets, one among the farmers who already use it and the other among the farmers who are non-users, such heavy fertilizer using states as Maine, New Jersey, the Carolinas, and Florida offer less opportunity for increased sales.

#### The Average Fertilizer Purchase

The largest purchases of fertilizer per farm were reported for states where fruits, vegetables, tobacco and cotton are the principal crops. Rates of application are substantially

TABLE IV.

Average Amount of Fertilizer Purchased in 1938 by the Fertilizer Users Who Were Interviewed

State	Tons	State	Tons
Florida .....	37.1	Illinois .....	5.1
New Jersey .....	23.7	Texas .....	5.0
North Carolina .....	22.6	Mississippi .....	4.6
California .....	16.9	Washington .....	4.2
South Carolina .....	15.1	Ohio .....	3.8
Massachusetts .....	10.7	Indiana .....	3.5
New York .....	10.4	Missouri .....	3.5
Maine .....	10.3	Vermont .....	3.5
Iowa .....	9.8	Kentucky .....	3.3
Connecticut .....	9.5	Tennessee .....	3.2
Georgia .....	8.9	Rhode Island .....	3.0
Alabama .....	8.9	West Virginia .....	3.0
Delaware .....	8.0	Arkansas .....	3.0
Virginia .....	8.0	Michigan .....	2.9
Louisiana .....	7.2	Wisconsin .....	2.9
Maryland .....	6.6	New Hampshire .....	2.2
Oregon .....	5.4	Minnesota .....	1.5
Pennsylvania .....	5.4		

greater for these crops than for grains and glasslands and consequently the purchases per farm are larger. The largest per-farm fertilizer purchases reported in the 1929 census were in New Jersey, Florida and California, which also ranked high in the survey. The survey figures for the Carolinas are probably much too high.

The survey shows that 9.6 percent of the farmers who were interviewed bought no fer-



## STEDMAN Low Cost All Steel FERTILIZER MIXING UNITS

BATCH MIXERS

PAN MIXERS

TAILINGS PULVERIZERS

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TWO TYPES & SIZES CAPACITIES 5 to 60 TONS PER HOUR

CAGE MILLS

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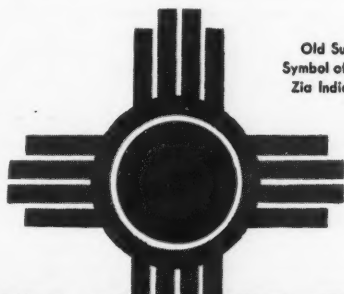
MIXING SYSTEMS

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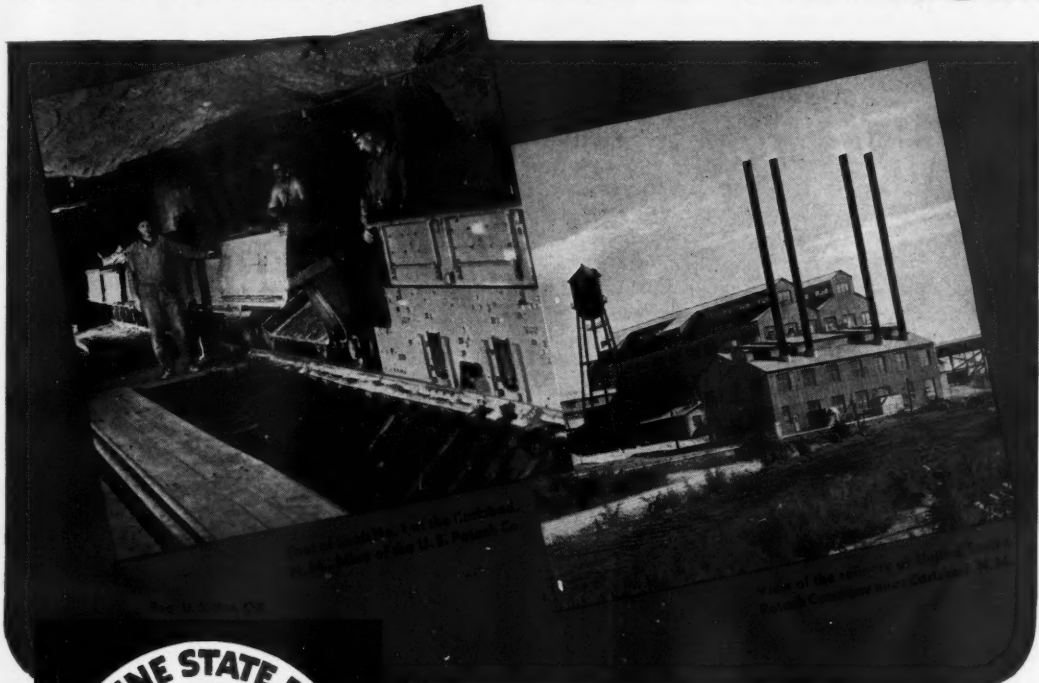
MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

FOR SUPERIOR BLENDING  
QUALITY AND CONSISTENT  
UNIFORMITY CHOOSE . . .



Old Sun  
Symbol of the  
Zia Indians

# SUNSHINE STATE POTASH



● The Old Zia sun symbol, well known in New Mexico, the Sunshine State, has been adopted as the trade mark for Sunshine State Potash.

When you use "Sunshine State Potash," you'll know it's the right Potash because of (1) the consistently uniform analyses of our Muriate of Potash and Manure Salts, and (2) the careful sizing, that makes handling and blending easy.

**HIGRADE MURIATE OF POTASH**  
62/63%  $K_2O$  ALSO 50%  $K_2O$  GRADE

● **MANURE SALTS**  
APPROXIMATELY 30%  $K_2O$

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NEW YORK, N. Y.**

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

TABLE V.  
Quantities of Fertilizer Purchased in 1938 by Farmers Interviewed  
(Summary for 35 States)

Tons Purchased	Total Farmers Interviewed	Per Cent of Total Interviewed	Quantity Purchased (Tons)	Per Cent of Total Purchased	Average Purchase (Tons)
None .....	3,071	9.6	.....	...	...
Less than 1 .....	2,293	7.1	1,500.9	0.5	0.7
1 to 4.9 .....	14,459	45.0	37,195.9	13.3	2.6
5 to 9.9 .....	6,306	19.6	43,108.0	15.4	6.8
10 to 24.9 .....	3,913	12.2	58,644.3	20.9	15.0
25 to 49.9 .....	1,230	3.8	42,093.7	15.0	34.2
50 to 99.9 .....	553	1.7	37,865.7	13.5	68.5
100 or more .....	322	1.0	59,822.6	21.3	185.8
Total .....	32,147	100.0	280,231.1	100.0	9.6

tilizer in 1938, 7.1 per cent bought less than a ton and 45.0 per cent bought between 1 and 4.9 tons. Large users—those who bought 25 or more tons each—accounted for 6.5 per cent of the total, with 1.0 per cent of the farmers reporting purchases of 100 tons or more.

While the small users are important numerically they account for a relatively small proportion of the total tonnage. The 52.1 per cent who bought less than 5 tons each purchased only 13.8 per cent of the total tonnage. At the other extreme the ten per cent of the farmers who bought 100 tons or more accounted for 21.3 per cent of the total tonnage. The 6.5 per cent who bought more than 25 tons apiece were responsible for 49.8 per cent of total sales.

#### JAPANESE FERTILIZER PRICES STABILIZED

An agreement was reached between the Japanese Finance Ministry of Commerce and Industry, and the Cabinet Planning Board on December 21, 1939, to stabilize prices of the leading chemical fertilizers at current levels until the end of June, 1940. In reaching this agreement, the officials reversed a previous decision which would have permitted a substantial increase in ammonium sulphate, cyanamide, and superphosphate quotations. The original understanding was reached following representations by the leading fertilizer manufacturers in Japan to the effect that profits were no longer possible at the fixed price levels established by the Government. Such a storm of protest was raised by the agriculturists when it became known that the Government had agreed to permit advances in the official fertilizer quotations that it was deemed advisable to adopt a new policy, namely subsidization of fertilizer manufacturers.

According to trade reports, it is estimated that a subsidy of 20,000,000 yen will be required for fertilizer manufacturers during the first half of 1940. The prevailing fertilizer quotations which have been officially established until the end of June, 1940, and the extent of the Government subsidy are as follows:

Type of Fertilizer	Official Price (Yen)	Subsidy (Yen)
Ammonium sulphate .....	3.75 per 37.5 kg.	0.64
Cyanamid .....	1.93 per 22.5 kg.	0.18
Superphosphate (19.7%) ..	2.17 per 37.5 kg.	0.16



## ACID PLANTS

#### COMPLETE FERTILIZER PLANTS ACID CONCENTRATORS AMMONIA OXIDATION UNITS

CHEMICO Service includes complete processes, equipment and structures, training of working crew, and initial operating supervision.

CHEMICO performance guarantees are based on 25 years of specialized experience in acid production and recovery, and the results obtained in world-wide installations.

*Your Inquiry is Invited*

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**CHEMICO PLANTS are  
PROFITABLE INVESTMENTS**

For over 20 years we have  
served the Fertilizer Industry

### ACID-PROOF CEMENT

Ready Mixed—For Immediate Use  
Packed in 250-lb. Steel Drums  
Dry-Packed in 100-lb. Bags

### CHEMICAL PUTTY

Stops Acid, Gas and Water Leaks

### QUARTZ PEBBLES

Graded to Size

### FILTER GRAVEL, FILTER SAND

### ACID VALVES

SOUTHERN DISTRIBUTORS OF  
CALGON (Sodium Hexametaphosphate)

### ACID BRICK, SPIRAL RINGS

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Laboratories, Plant, Office  
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Use 20 Mule Team Borax or  
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to the soil when recom-  
mended by the agricultural  
authorities.

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on request



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MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

### BRITISH FERTILIZER CONTROL

The British Ministry of Supply in an Order dated January 8, 1940 has assumed direct supervision of the fertilizer trade. The order provides that no person shall in the United Kingdom on or at any other time after February 12, 1940, produce for disposal, or distribute wholesale, any fertilizer; except under the authority of a license granted to him by the Minister of Supply. In the early weeks of the war the fertilizer trade had adopted a system of voluntary control.

Ministry of Supply regulations covering fertilizer and fertilizer materials have so far been limited to superphosphate, ground phosphate rock and mixed fertilizers. Maximum prices for superphosphates were named for the period November, 1939-February, 1940. Increases have been authorized over the cash price ruling during the period of 4 months ended June 30, 1939, which period is referred to as the "basic period." The addition permitted for November was 9s. 0d., for December, 11s. 0d., for January, 17s. 6d., and for February, 19s. 0d. A breakdown of the addition permitted for February shows an allowance of 12s. 6d. for raw materials, 4s. 6d. for bags and 2s. 0d. for general charges. A maximum of 21s. 3d. is permitted in the case of ground phosphate rock for delivery in February, 1940. For mixed fertilizer manufacturers are permitted to add 10½d. for each unit of soluble  $P_2O_5$ , 9d. for each unit of  $K_2O$  from sulfate and 5d. from muriate or other potash salts. No increase is permitted for sulfate of ammonia for a fertilizer delivered at Great Britain. The mixed fertilizer seller can add 4s. 6d. for bags (used) per ton and 2s. 0d. by way of general addition per ton.

It is said that supplies of fertilizer materials are ample. Nitrogen is obtained from Great Britain as a by-product of coal distillation, fixation of atmospheric nitrogen and imports of natural sodium nitrate from Chile. Producers have advanced prices of ammonium sulphate by about 20 per cent to meet the costs of packing, transportation and general manufacture. Potash supplies continue to be imported from France and Palestine. Prices are also 20 per cent above those ruling last year.

### PRICE SITUATION FAVORABLE TO PASTURE FERTILIZATION

Prices farmers received for butterfat are 19 per cent higher than a month ago, and it seems likely that prices will remain high for several months. Since production is also running at a high level, it is apparent that dairy farmers are in a favorable position from the standpoint of gross income. Prices paid for feed, though, are up 15 per cent from a year ago, so net income is not rising as much as is gross. Under such conditions as these, farmers can benefit materially by increased use of fertilizer on their pastures. It is to their advantage to depend more on pastures and less on purchased feed, particularly at this time when fertilizer prices are not substantially higher.

### PRICE INCREASES IN FERTILIZER LESS THAN IN OTHER COMMODITIES

Prices of certain commodities have risen to a marked degree during the past several months. Average prices received by farmers for their products in January, for instance, were 12.5 per cent higher than they were last August, the U. S. Department of Agriculture reports.

Fertilizer prices have shown only a moderate rise since last summer, the increase being much less than that in the general price level. This failure of fertilizer prices to rise as much as the prices of other commodities is in keeping with the past price record of fertilizer and does not reflect new conditions facing the industry. In each of the three periods of rising prices which have marked the broad upward trend of the last seven years the price of fertilizer has risen less than the price of other commodities. From the 1933 lows to the 1935 highs prices received by farmers rose 100 per cent, prices for all commodities rose 29 per cent and price paid for fertilizer went up only 18 per cent. In the 1936-1937 upturn the comparable percentage increases were 26, 12, and 8. While it is not known what the final figures for the current rise will show, to date fertilizer has had a relatively small increase.

Some other price facts, based on U. S. Department of Agriculture reports: fertilizer

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*Brokers* **Fertilizer**  
**Materials**

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Miners of FLORIDA LAND PEBBLE

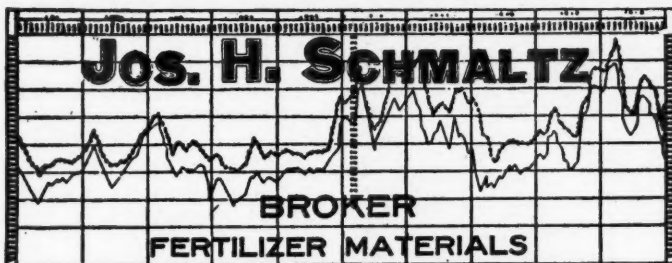
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~ all commercial grades!

Plants at Sangully, Pauway, Medulla and Ridgewood, Fla.

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Tankage  
Blood  
Bone  
All  
Ammoniates



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CHICAGO

OFFICIAL BROKER FOR MILORGANITE

# "TRONA" POTASH

Trona Muriate of Potash is now being used from coast to coast. Uniformity—excellent mixing qualities—prompt deliveries—have contributed to the increasing popularity of this American product.

*Manufacturers of Three Elephant Borax and Boric Acid*  
See Page 4

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**AMERICAN POTASH & CHEMICAL CORPORATION**

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New York City

**TRONA**

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

prices are now only 9 per cent above the 1933 low, all commodities bought by farmers are up 22 per cent; fertilizer prices are 24 per cent below the 1929 average, all commodities are 20 per cent below; although total farm cash income was 2.7 billion dollars less in 1939 than in 1929, the purchasing power of farm income in terms of fertilizer was the same in the two years.

### SULPHATE OF AMMONIA PRODUCTION ON HIGH LEVEL

During January the production of by-product sulphate of ammonia continued at the high level established last fall. The January tonnage of 60,393 tons, as reported by the U. S. Bureau of Mines, was only a few tons under the December, 1939, output of 60,455 tons and about 30 per cent higher than the January, 1939, figures of 45,757 tons.

By-product ammonia liquor showed production of 2,404 tons (NH<sub>3</sub> content) in January, 1940, compared with 2,449 tons in December, 1939, and 1,966 tons in January, 1939.

During 1939, the monthly production of by-product sulphate of ammonia and ammonia liquor was as follows:

1939	Sulphate of Ammonia Tons	Ammonia Liquor Tons (NH <sub>3</sub> Content)
January .....	45,757	1,966
February .....	41,780	1,787
March .....	46,670	2,017
April .....	39,634	1,782
May .....	33,064	1,511
June .....	42,253	1,936
July .....	46,526	1,963
August .....	50,565	1,901
September .....	52,833	1,973
October .....	59,256	2,388
November .....	59,745	2,431
December .....	60,455	2,449
Total .....	578,538	24,104

### AMERICAN POTASH & CHEMICAL CORP. TO PRODUCE BROMINE

To supplement their production of other chemical products from Searles Lake brine, the American Potash & Chemical Corporation are now installing machinery to recover bromine from which will be produced both liquid bromine and alkali bromides. The brine in Searles Lake contains about 12 times as much bromine as does sea water, and during 1939 over one billion gallons of the brine

was treated at the Trona plant in the manufacture of potash salts, borax, soda ash, salt cake, etc. This quantity carries almost ten million pounds of bromine, of which it is planned at present to recover from two to three million pounds per year. The design and layout of the new department has been carried out by the company's research and engineering staff. Production is expected to start during the coming spring.

Cotton exports in January amounted to 1,027,000 bales. This is the largest single month's exports since November, 1935. From August 1, 1939, through February 16, 1940, 4,462,000 bales were exported, compared with 2,363 bales in the same period of 1938-39, and 4,142 bales in the same period of 1937-38.

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OWNER might consider sale of one of southern California's most modern fertilizer plants, extensively operated throughout the West. Possesses most enviable reputation. Owner has other interests. Address "460," care THE AMERICAN FERTILIZER, Philadelphia.



*Specializing in*

**Sulphate of Ammonia  
Low Grade Ammoniates  
Superphosphate  
Sulphuric Acid  
Bags**

*Inquiries and offerings  
invited*

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By GILBERT H. COLLINGS, PH.D., Associate Professor of Agronomy, Clemson Agricultural College. A modern, complete study of all fertilizer problems, well illustrated. The book gives actual research data, and the work of many agronomists, chemists and engineers has been reviewed. Each chapter has been read by authorities connected with organizations producing or marketing the products discussed; thus it represents a composite of the best opinions and conclusions in the fertilizer industry. 365 pages. 85 illustrations. Price \$4.00.

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By A. F. GUSTAFSON, PH.D., Professor of Soil Technology, Cornell University. A revised edition of this popular treatise. Covers the sources, character and composition of fertilizers and fertilizer materials. The food requirements of different crops and the effects of different fertilizers. A valuable volume for fertilizer manufacturers and salesmen, county agents, agricultural teachers, farmers and truckers. 172 pages. 5 x 8. Price \$1.75.

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By H. J. WHEELER. A clear and unusually full discussion of the practical utilization of manures and fertilizers of all kinds and of their relations to the plant and to the soil. 389 pages. 5 1/4 x 7 1/4. Illustrated. Price \$2.75.

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By W. H. WAGGAMAN. A comprehensive treatise, covering completely the subjects of phosphoric acid and phosphate—the sources, the processes of treatment, the products obtained, and their uses in agriculture and the arts. The volatilization process for producing phosphoric acid is fully discussed. In addition to the use of phosphate as a fertilizer material, there are chapters on phosphate baking powders, phosphate water softeners, and miscellaneous uses. This book is one of the American Chemical Society's technologic monographs and contains extended references to the literature, which facilitates further study of the subject. 366 pages. Price \$5.75.

## Potash Deficiency Symptoms

By OSKAR ECKSTEIN, ALBERT BRUNO and J. W. TURRENTINE. A revised edition which explains in detail the signs of potash deficiency in all the important cultivated crops as shown in appearance and structure of leaf, root, fruit, etc.; also the influence of a lack of potash on resistance to plant diseases, pests and climatic factors. Printed in English, French and German. Profusely illustrated with 55 color plates and 41 black and white engravings. 248 pages. 7 x 9 1/2. Price \$2.25.

## Potash: A Review, Estimate and Forecast

By J. W. TURRENTINE, M.S., PH.D., in charge of Potash Investigations, Bureau of Soils, U. S. Department of Agriculture. This book, written by an authority on the subject, covers in detail the American and foreign potash industry. This book deals with the technology of potash manufacture from numerous raw materials; the occurrence, properties and relative values of various potash minerals and the technology of extraction; the technology of utilizing potash-bearing industrial wastes for the manufacture of potash salts. European and other foreign sources of supply are given special attention. 188 pages. 6 x 9. Illustrations and tables. Price \$3.00.

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# BUYERS' GUIDE

A CLASSIFIED INDEX TO ALL THE ADVERTISERS IN "THE AMERICAN FERTILIZER"



This list contains representative concerns in the Commercial Fertilizer Industry, including fertilizer manufacturers, machinery and equipment manufacturers, dealers in and manufacturers of commercial fertilizer materials and supplies, brokers, chemists, etc.  
For Alphabetical List of Advertisers, see page 33.



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Charlotte Chem. Laboratories, Inc., Charlotte, N. C.  
Chemical Construction Corp., New York City.

## ACID EGGS

Chemical Construction Corp., New York City.

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## BAGS (Waterproof)—Manufacturers

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A Classified Index to Advertisers in  
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## BUYERS' GUIDE

For an Alphabetical List of all the  
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**CLUTCHES**

Link-Belt Company, Philadelphia, Chicago.  
Sackett & Sons Co., The A. J., Baltimore, Md.  
Stedman's Foundry and Mach. Works, Aurora, Ind.

**CONCENTRATORS**—Sulphuric Acid

Chemical Construction Corp., New York City.  
Fairlie, Andrew M., Atlanta, Ga.

**CONDITIONERS AND FILLERS**

American Limestone Co., Knoxville, Tenn.  
Burns & Company, L. D., Atlanta, Ga.

**CONTACT ACID PLANTS**

Chemical Construction Corp., New York City.

**COPPER SULPHATE**

Tennessee Corporation, Atlanta, Ga.

**COTTONSEED PRODUCTS**

Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City.  
Bradley & Baker, New York City.  
Huber & Company, New York City.  
Jett, Joseph C., Norfolk, Va.  
Schmalts, Jos. H., Chicago, Ill.  
Taylor, Henry L., Wilmington, N. C.  
Wellmann, William E., Baltimore, Md.

**CRANES AND DERRICKS**

Hayward Company, The, New York City.  
Link-Belt Company, Philadelphia, Chicago.  
Link-Belt Speeder Corp., Chicago, Ill. and Cedar  
Rapids, Iowa.

**CYANAMID**

American Agricultural Chemical Co., New York City.  
American Cyanamid Co., New York City.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City.  
Bradley & Baker, New York City.  
Jett, Joseph C., Norfolk, Va.  
Taylor, Henry L., Wilmington, N. C.  
Wellmann, William E., Baltimore, Md.

**DENS**—Superphosphate

Chemical Construction Corp., New York City.  
Stedman's Foundry and Mach. Works, Aurora, Ind.  
Sturtevant Mill Co., Boston, Mass.

**Andrew M. Fairlie**  
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**SULPHURIC Acid Plants . . . Design, Construction,  
Equipment . . . Operation . . . Mills-Packard Water-  
Cooled Acid Chambers, Gaillard Acid-Cooled Chambers,  
Gaillard Acid Dispersers, Contact Process Sulphuric  
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Sackett & Sons Co., The A. J., Baltimore, Md.  
Stedman's Foundry and Mach. Works, Aurora, Ind.

### DOUBLE SUPERPHOSPHATE (See Superphosphate—Concentrated)

### DEYERS—Direct Heat

Sackett & Sons Co., The A. J., Baltimore, Md.

### DRIVES—Electric

Link-Belt Company, Philadelphia, Chicago.

### DUMP CARS

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Stedman's Foundry and Mach. Works, Aurora, Ind.

### DUST COLLECTING SYSTEMS

Sturtevant Mill Co., Boston, Mass.

### ELECTRIC MOTORS AND APPLIANCES

Atlanta Utility Works, East Point, Ga.

### ELEVATORS

Atlanta Utility Works, East Point, Ga.  
Jeffrey Mfg. Co., Columbus, Ohio.  
Link-Belt Company, Philadelphia, Chicago.  
Sackett & Sons Co., The A. J., Baltimore, Md.  
Stedman's Foundry and Mach. Works, Aurora, Ind.

### ELEVATORS AND CONVEYORS—Portable

Link-Belt Company, Philadelphia, Chicago.  
Sturtevant Mill Co., Boston, Mass.

### ENGINEERS—Chemical and Industrial

Chemical Construction Corp., New York City.  
Fairlie, Andrew M., Atlanta, Ga.  
Link-Belt Company, Philadelphia, Chicago.  
Stedman's Foundry and Mach. Works, Aurora, Ind.  
Sturtevant Mill Co., Boston, Mass.

### ENGINES—Steam

Atlanta Utility Works, East Point, Ga.  
Sackett & Sons Co., The A. J., Baltimore, Md.

### EXCAVATORS AND DREDGES—Drag Line and Cableway

Hayward Company, The, New York City.  
Link-Belt Company, Philadelphia, Chicago.  
Link-Belt Speeder Corp., Chicago, Ill. and Cedar Rapids, Iowa.

### FERTILIZER MANUFACTURERS

American Agricultural Chemical Co., New York City.  
American Cyanamid Co., New York City.  
Armour Fertilizer Works, Atlanta, Ga.  
Farmers Fertilizer Co., Columbus, Ohio.  
International Agricultural Corp., New York City.  
Smith-Rowland Co., Norfolk, Va.  
U. S. Phosphoric Products Corp., New York City.

### FISH SCRAP AND OIL

Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City.  
Bradley & Baker, New York City.  
Burns & Company, L. D., Atlanta, Ga.  
Huber & Company, New York City.  
Jett, Joseph C., Norfolk, Va.  
Taylor, Henry L., Wilmington, N. C.  
Wellmann, William E., Baltimore, Md.

### FOUNDERS AND MACHINISTS

Atlanta Utility Works, East Point, Ga.  
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.  
Link-Belt Company, Philadelphia, Chicago.  
Sackett & Sons Co., The A. J., Baltimore, Md.  
Stedman's Foundry and Mach. Works, Aurora, Ind.

### GARBAGE TANKAGE

Wellmann, William E., Baltimore, Md.

### GEARS—Machine Moulded and Cut

Link-Belt Company, Philadelphia, Chicago.  
Sackett & Sons Co., The A. J., Baltimore, Md.  
Stedman's Foundry and Mach. Works, Aurora, Ind.

### GEARS—Silent

Link-Belt Company, Philadelphia, Chicago.

### GELATINE AND GLUE

American Agricultural Chemical Co., New York City.

### GUANO

Baker & Bro., H. J., New York City.

### HOISTS—Electric, Floor and Cage Operated, Portable

Hayward Company, The, New York City.

### HOPPERS

Atlanta Utility Works, East Point, Ga.  
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Sackett & Sons Co., The A. J., Baltimore, Md.  
Stedman's Foundry and Mach. Works, Aurora, Ind.  
Sturtevant Mill Co., Boston, Mass.

### IMPORTERS, EXPORTERS

Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City.  
Bradley & Baker, New York City.  
Wellmann, William E., Baltimore, Md.

### IRON SULPHATE

Tennessee Corporation, Atlanta, Ga.

### INSECTICIDES

American Agricultural Chemical Co., New York City.  
Burns & Company, L. D., Atlanta, Ga.

### LACING—Belt

Flexible Steel Lacing Co., Chicago, Ill.

### LIMESTONE

American Agricultural Chemical Co., New York City.  
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Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City.  
Bradley & Baker, New York City.  
Wellmann, William E., Baltimore, Md.

### LOADERS—Car and Wagon, for Fertilizers

Link-Belt Company, Philadelphia, Chicago.

### MACHINERY—Acid Making

Atlanta Utility Works, East Point, Ga.  
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.  
Chemical Construction Corp., New York City.  
Duriron Co., Inc., The, Dayton, Ohio.  
Fairlie, Andrew M., Atlanta, Ga.  
Monarch Mfg. Works, Inc., Philadelphia, Pa.  
Sackett & Sons Co., The A. J., Baltimore, Md.  
Stedman's Foundry and Mach. Works, Aurora, Ind.  
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### MACHINERY—Coal and Ash Handling

Hayward Company, The, New York City.  
Link-Belt Company, Philadelphia, Chicago.  
Sackett & Sons Co., The A. J., Baltimore, Md.

### MACHINERY—Elevating and Conveying

Atlanta Utility Works, East Point, Ga.  
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### MACHINERY—Power Transmission

Link-Belt Company, Philadelphia, Chicago.  
Sackett & Sons Co., The A. J., Baltimore, Md.  
Stedman's Foundry and Mach. Works, Aurora, Ind.

### MACHINERY—Pumping

Atlanta Utility Works, East Point, Ga.  
Durlon Co., Inc., The, Dayton, Ohio.

### MACHINERY—Tankage and Fish Scrap

Atlanta Utility Works, East Point, Ga.  
Sackett & Sons Co., The A. J., Baltimore, Md.  
Stedman's Foundry and Mach. Works, Aurora, Ind.  
Sturtevant Mill Co., Boston, Mass.

### MAGNETS

Atlanta Utility Works, East Point, Ga.  
Stedman's Foundry and Mach. Works, Aurora, Ind.

### MANGANESE SULPHATE

Tennessee Corporation, Atlanta, Ga.

### MIXERS

Atlanta Utility Works, East Point, Ga.  
Ransome Concrete Machinery Co., Dunellen, N. J.  
Sackett & Sons Co., The A. J., Baltimore, Md.  
Stedman's Foundry and Mach. Works, Aurora, Ind.  
Sturtevant Mill Co., Boston, Mass.

### NITRATE OF SODA

American Agricultural Chemical Co., New York City.  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City.  
Barrett Company, The, New York City.  
Bradley & Baker, New York City.  
Chilean Nitrate Sales Corp., New York City.  
Huber & Company, New York City.  
International Agricultural Corp., New York City.  
Schmaltz, Jos. H., Chicago, Ill.  
Wellmann, William E., Baltimore, Md.

### NITRATE OVENS AND APPARATUS

Chemical Construction Corp., New York City.

### NITROGENOUS ORGANIC MATERIAL

American Agricultural Chemical Co., New York City.  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City.  
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Burns & Company, L. D., Atlanta, Ga.  
Du Pont de Nemours & Co., E. I., Wilmington, Del.  
Huber & Company, New York City.  
International Agricultural Corp., New York City.  
Smith-Rowland Co., Norfolk, Va.  
Wellmann, William E., Baltimore, Md.

### NOZZLES—Spray

Monarch Mfg. Works, Inc., Philadelphia, Pa.

### PACKING—For Acid Towers

Charlotte Chem. Laboratories, Inc., Charlotte, N. C.  
Chemical Construction Corp., New York City.

### PANS AND POTS

Stedman's Foundry and Mach. Works, Aurora, Ind.

### PHOSPHATE MINING PLANTS

Chemical Construction Corp., New York City.

### PHOSPHATE ROCK

American Agricultural Chemical Co., New York City.  
American Cyanamid Co., New York City.  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City.  
Bradley & Baker, New York City.  
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Huber & Company, New York City.  
International Agricultural Corp., New York City.  
Jett, Joseph C., Norfolk, Va.  
Ruhm, H. D., Mount Pleasant, Tenn.  
Schmaltz, Jos. H., Chicago, Ill.  
Southern Phosphate Corp., Baltimore, Md.  
Taylor, Henry L., Wilmington, Del.  
Wellmann, William E., Baltimore, Md.

### PIPE—Acid Resisting

Durlon Co., Inc., The, Dayton, Ohio.

### PIPES—Chemical Stoneware

Chemical Construction Corp., New York City.

### PIPES—Wooden

Stedman's Foundry and Mach. Works, Aurora, Ind.

### PLANT CONSTRUCTION—Fertilizer and Acid

Chemical Construction Corp., New York City.  
Fairlie, Andrew M., Atlanta, Ga.

### POTASH SALTS—Dealers and Brokers

American Agricultural Chemical Co., New York City.  
Armour Fertilizer Works, Atlanta, Ga.  
Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City.  
Bradley & Baker, New York City.  
Huber & Company, New York City.  
International Agricultural Corp., New York City.  
Jett, Joseph C., Norfolk, Va.  
Schmaltz, Jos. H., Chicago, Ill.  
Synthetic Nitrogen Products Co., New York City.  
Taylor, Henry L., Wilmington, Del.  
Wellmann, William E., Baltimore, Md.

### POTASH SALTS—Manufacturers and Importers

American Potash and Chem. Corp., New York City.  
Potash Co. of America, Baltimore, Md.  
United States Potash Co., New York City.

### PULLEYS AND HANGERS

Atlanta Utility Works, East Point, Ga.  
Jeffrey Mfg. Co., Columbus, Ohio.  
Link-Belt Company, Philadelphia, Chicago.  
Sackett & Sons Co., The A. J., Baltimore, Md.  
Stedman's Foundry and Mach. Works, Aurora, Ind.  
Sturtevant Mill Co., Boston, Mass.

### PUMPS—Acid-Resisting

Charlotte Chem. Laboratories, Inc., Charlotte, N. C.  
Durlon Co., Inc., The, Dayton, Ohio.  
Monarch Mfg. Works, Inc., Philadelphia, Pa.

### PYRITES—Brokers

Ashcraft-Wilkinson Co., Atlanta, Ga.  
Baker & Bro., H. J., New York City.  
Jett, Joseph C., Norfolk, Va.  
Wellmann, William E., Baltimore, Md.

### QUARTZ

Charlotte Chem. Laboratories, Inc., Charlotte, N. C.

### RINGS—Sulphuric Acid Tower

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### SCRAPERS—Drag

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### SEPARATORS—Air

Sturtevant Mill Co., Boston, Mass.

### SEPARATORS—Including Vibrating

Link-Belt Company, Philadelphia, Chicago.  
Sturtevant Mill Co., Boston, Mass.

### SEPARATORS—Magnetic

Stedman's Foundry and Mach. Works, Aurora, Ind.

### SHAFTING

Atlanta Utility Works, East Point, Ga.  
Link-Belt Company, Philadelphia, Chicago.  
Sackett & Sons Co., The A. J., Baltimore, Md.  
Stedman's Foundry and Mach. Works, Aurora, Ind.

### SHOVELS—Power

Link-Belt Company, Philadelphia, Chicago.  
Link-Belt Speeder Corp., Chicago, Ill. and Cedar  
Rapids, Iowa.

### SPRAYS—Acid Chambers

Monarch Mfg. Works, Inc., Philadelphia, Pa.

### SPROCKET WHEELS (See Chains and Sprockets)

### STACKS

Sackett & Sons Co., The A. J., Baltimore, Md.

### SULPHATE OF AMMONIA

American Agricultural Chemical Co., New York City.  
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### SULPHUR

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Texas Gulf Sulphur Co., New York City.

### SULPHURIC ACID

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Jett, Joseph C., Norfolk, Va.  
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Wellmann, William E., Baltimore, Md.

### SUPERPHOSPHATE

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Ashcraft-Wilkinson Co., Atlanta, Ga.  
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Wellmann, William E., Baltimore, Md.

### SUPERPHOSPHATE—Concentrated

Armour Fertilizer Works, Atlanta, Ga.  
International Agricultural Corp., New York City.  
U. S. Phosphoric Products Corp., New York City.

### SYPHONS—For Acid

Monarch Mfg. Works, Inc., Philadelphia, Pa.

### TALLOW AND GREASE

American Agricultural Chemical Co., New York City.

### TANKAGE

American Agricultural Chemical Co., New York City.  
Armour Fertilizer Works, Atlanta, Ga.  
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Smith-Rowland Co., Norfolk, Va.  
Taylor, Henry L., Wilmington, N. C.  
Wellmann, William E., Baltimore, Md.

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Huber & Company, New York City.

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Sackett & Sons Co., The A. J., Baltimore, Md.

### TILE—Acid-Proof

Charlotte Chem. Laboratories, Inc., Charlotte, N. C.

### TOWERS—Acid and Absorption

Chemical Construction Corp., New York City.  
Fairlie, Andrew M., Atlanta, Ga.

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Du Pont de Nemours & Co., E. I., Wilmington, Del.  
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### UREA-AMMONIA LIQUOR

Du Pont de Nemours & Co., E. I., Wilmington, Del.

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